REMARKS

Claims 1, 6 and 12 are amended. Thus, by this Amendment, Claims 1, 3 through 12 and 21 are presented for examination.

All claims of this application have been rejected. Claims 1, 3, 5, 7 through 9, 11 and 21 are rejected as allegedly rendered obvious by the United States patent of Segerstrom et al. in view of that of Paquet et al. while Claims 4, 6, 10 and 12 are rejected as allegedly rendered obvious by Segerstrom et al. in view of Paquet et al. further in view of Hoffman et al.

The current rejections address the arguments and changes to the claims made by the Applicant in a previous Amendment. The Examiner has effectively conceded that the prior Amendment overcame the Examiner's prior position, stating, in response to the prior Amendment, "Applicant's arguments with respect to claims 1, 3-12, and 21 have been considered but are moot in view of the new ground(s) of rejection." As the Paquet et al. and Hoffman et al. patents formed the basis of the prior rejections, Applicant's current arguments and claim amendments focus upon the relevance of the new reference.

Segerstrom et al. teaches a "Device For Stabilizing of a Remotely Controlled Sensor, Like a Camera". Basically, this

patent teaches a camera 1 mounted within a multiple gimbal system that is mechanically coupled to a stand 12 comprising an upper frame 18 that is resiliently coupled to a lower frame 19. As described clearly in this patent, the Segerstrom et al. device is directed to stabilization of the line of sight of the camera 1 when the stand 12 is mounted to an unsteady platform such as a helicopter or other vehicle.

Stabilization of the line of sight is accomplished by multiple means. First, a self-acting rate gyro 2 is fixed to the camera 1. Secondly, gyro-controlled set motors 10 and 11, each being necessarily d.c. driven, drive axes 7 and 9 to further stabilize the camera 1. The set motor 10 drives the axis 7 and the set motor 11 drives the axis 9 to thereby affect the pitch and yaw of the camera 1. The signals for driving the d.c. motors 10 and 11 are generated by an electronic unit 15 that receives inputs from a first rate gyro 13 and a second rate gyro 14 that sense yaw and pitch angle rates, respectively, of the helicopter or other platform. Thus, the motors 10 and 11 stabilize the position of the camera 1 within the gimbal system fixed to an unsteady platform and the self-acting rate gyro 2 stabilizes the line of sight of the thusly-positioned camera 1.

In seeking to apply the teachings of Setgerstrom et al. to Paquet et al., the Examiner states "It would have been obvious

to one of ordinary skill in the art at the time the invention was made to modify Segerstrom such that the rate gyros are the typical two-degree-of-freedom, dry-tuned gyroscope, view of Paquet, in order to provide a high resolution rebalance loop, which is capable of producing a precise output measurement of angular rate of the gyroscope rotor about each rotor axis." (Emphasis added.)

The present invention is not directed to stabilization of the position of a device, such as a camera, within a gimballed system. Neither is it directed to enhancing the precision of measurement of a device in such a system. Rather, it is directed to solution of a problem --coning (e.g., of the line of sight of a camera)-- that is present where one attempts to oscillate a device, such as a camera, by torquing the rotor of a two degree-of-freedom gyro fixed to the device.

Neither Segerstrom et al. nor Paquet et al. is concerned with creating and guiding the motion of a device such as a camera fixed to a two degree-of-freedom gyro in a gimballed system. In the invention, unlike Paquet et al., the driving signal that initiates motion of the device within the gimballed system is exogoneous; that is, it is chosen. In contrast, in Paquet, the rebalance loop of Paquet et al., as well as the gyros of Segerstrom et al., rely upon endogenous error signal inputs.

Applicant has amended Claim 1 to make the foregoing distinctions explicit. The preamble to Claim 1 and the claims that depend therefrom defines "apparatus for oscillating a device fixed to a two degree of freedom gyroscope having a spinning rotor...associated with a two-axis system." A first forcer applies a first torque "in response to a first alternating signal". A cross-axis circuit is provided "for receiving said first signal and deriving the second signal as the derivative thereof". The first and second signals drive torquers that apply torque to the gyro rotor while pickoffs sense motion of the rotor and apply signals responsive to such sensed rotor motion to motors that drive the device with respect to first and second device axes. It is the essence of the invention that an alternating signal for driving oscillating motion is applied to one of two orthogonal torquers of a gyro rotor while the precession of the rotor that would otherwise lead to coning of the device is cancelled by the derivation of a signal for application to the second torquer that exactly cancels out the harmful precession that would otherwise occur. Such second signal is derived, as explained in the application and as defined in the claims, as the derivative of the first signal.

The art relied upon by the Examiner neither addresses nor teaches, either alone or in any reasonable combination, a system in which an exogoneous alternating signal causes a two

degree of freedom gyro to drive a device mounted within a two axis system to oscillate without coning.

For the foregoing reasons, all pending claims of this application clearly define patentable subject matter. Prompt allowance and issuance of all such claims are therefore earnestly solicited.

Respectfully submitted,

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